Amendments to the Specification

Please replace the paragraphs beginning at page 7, line 15, through page 8, line 10 with the following rewritten paragraphs:

In the above-described data transmission system Csl, when transmitting data by PPP using the V. Jacobson's header compression method, two types of packets are used as the PPP packets Pppp to be transmitted by this protocol, as shown in ~~figure 30~~ figures 30(a) and 30(b). That is, one is a compressed packet Py in which data to be transmitted (hereinafter referred to as transmission data) stored in the data section is compressed (refer to figure 30(b)), and the other is an uncompressed packet Px in which transmission data stored in the data section is not compressed (refer to figure 30(a)). Figures 30(a) and 30(b) show only parts of these PPP packets, which are required for describing the V. Jacobson's header compression method.

That is, the uncompressed packet Px is composed of a header section Hpx containing header information, and a data section Dpx containing transmission data (D) as uncompressed data Ir to be transmitted by PPP. The information in the header section Hpx is composed of a compression/uncompression identifier Ihl which indicates whether the data in the data section Dpx is compressed ~~or not~~, and other header information Ih3. In the uncompressed packet Px, the identifier Ihl indicates "uncompressed".

Further, the compressed packet Py is composed of a header section Hpy containing header information, and a data section Dpy containing difference data (ΔD) as compressed data Id to be transmitted by PPP. The information in the header section Hpy is composed of a compression/uncompression identifier Ihl which indicates whether the data stored in the data section Dpy is compressed ~~or not~~, and other header information Ih3. In the compressed packet Py, the identifier Ihl indicates "compressed".

Please replace the paragraph beginning at page 24, line 6, with the following rewritten paragraph:

According to an eighteenth aspect of the present invention, there is provided a data transmission method for sequentially transmitting data in units of packets each containing transmission data, from the transmitting end to the receiving end, and this method comprises a first

data transmission process and a second data transmission process. The first data transmission process includes a transmission-side process of transmitting an uncompressed packet in which predetermined transmission data is stored as uncompressed data, and then continuously transmitting a compressed packet in which at least a portion of transmission data following the predetermined transmission data is compressed and stored as compressed data; and a reception-side process of receiving the packets transmitted from the transmitting end, and .restoring the transmission data of the respective packets on the basis of the uncompressed data and the compressed data stored in the respective packets. The transmission-side process includes a compression process of forming compressed data to be stored in a compressed packet to be transmitted, on the basis of the transmission data of a reference packet that is the uncompressed packet, and the transmission data of the compressed packet to be transmitted. The reception-side process includes a restoration process of restoring the transmission data of a compressed packet to be restored, on the basis of the transmission data of the reference packet, and the compressed data included in the compressed packet to be restored. The second data transmission process is for forming, at the transmitting end, compressed data to be stored in the compressed packet by a formation method different from the compressed data formation method employed in the first data transmission process, and restoring, at the receiving end, the compressed data stored in the compressed packet by a restoration. method different from the compressed data restoration method employed in the first data transmission process. In this method, when transmitting the transmission data in packet units, the data transmission process is switched between the first process and the second process according to whether ~~or not~~ a restoration error occurs in the compressed packet at the receiving end. Therefore, the quality of data transmitted by radio is improved when the error frequency is high, and the compression efficiency of transmission data is improved when the error frequency is low.

Please replace the paragraph beginning at page 29, line 22, with the following rewritten paragraph:

According to a twenty-third aspect of the present invention, in the data transmission method of the twenty-second aspect, the updation information is composed of a reference packet identifier which indicates, as a reference packet, either the uncompressed packet or the specific compressed

packet, and the transmission data corresponding to the reference packet; the compressed packet includes a reference packet identifier which indicate, as a reference packet, either the uncompressed packet or the specific compressed packet, and an information updation flag indicating whether the updation information is to be updated ~~or not~~; the information updation flag included in the specific compressed packet is set at a value indicating that the updation information is to be updated; and the information updation flags included in compressed packets other than the specific compressed packet are set at a value indicating that the updation information is not to be updated. Therefore, the receiving end can easily decide whether the updation information is to be updated ~~or not~~, according to the information updation flag.

Please replace the paragraphs beginning at page 32, line 11, through page 33, line 8 with the following rewritten paragraphs:

According to a twenty-ninth aspect of the present invention, in the data transmission method of the twenty-second aspect, the transmission data includes plural pieces of item-basis transmission data corresponding to different items; the compressed data includes plural pieces of item-basis compressed data corresponding different items; the item-basis compressed data corresponding to each item in the compressed data included in the compressed packet is obtained by compressing the item-basis compressed data corresponding to each item in the transmission data of the compressed packet by using the item-basis transmission data corresponding to each item in the transmission data of the uncompressed packet or the specific compressed packet; and each of the item-basis compressed data includes an item type flag which specifies the item corresponding to the compressed data. Therefore, the transmission data is compressed for each item, whereby optimum compression effect is realized for each item. Further, the storage area (e.g., RAM) for storing the ~~updation~~ updated information and the like is reduced. Thereby, the time and cost required for transmission of unrestorable packets are reduced and, further, the cost for fabrication of transmission terminal equipment or reception terminal equipment is reduced.

According to a ~~thirteenth~~ thirtieth aspect of the present invention, in the data transmission method of the twenty-ninth aspect, each of the item-basis compressed data includes data length

information indicating the length of the compressed data. Therefore, the item-basis compressed data is restored with efficiency.

Please replace the paragraph beginning at page 39, line 1, with the following rewritten paragraph:

According to a thirty-sixth aspect of the present invention, there is provided a data structure of a compressed packet which includes compressed data obtained by compressing at least a portion of transmission data and is to be transmitted after a reference packet which is used for restoration of the compressed data. The compressed packet comprises a data section in which the compressed data is stored, and a header section including a first identifier which indicates whether the data stored in the data section is compressed ~~or not~~, and a second identifier which identifies the reference packet. Therefore, even when a transmission error occurs in the compressed packet transmitted in the radio section, the receiving end can restore the subsequent compressed packets with reference to the transmission data of the uncompressed packet as the reference packet.

Please replace the paragraph beginning at page 40, line 12, with the following rewritten paragraph:

According to a thirty-eighth aspect of the present invention, there is provided a data structure of a compressed packet which includes compressed data obtained by compressing at least a portion of transmission data and is to be transmitted after a reference packet which is used for restoration of the compressed data. The compressed packet comprises a data section in which the compressed data is stored, and a header section including a first identifier which indicates whether the data stored in the data section is compressed ~~or not~~, a second identifier which identifies the reference packet, and a reference information updation flag which indicates whether reference information corresponding to the transmission data of the reference packet is to be updated ~~or not~~. Therefore, the quality of data transmitted in the radio section is improved to increase the effective rate of data transmission and, further, the data compression efficiency is improved. As the result, the time and cost required for transmission of unrestorable packets are significantly reduced. Further, since the reference

information required for restoration of the compressed packet, the number of times the uncompressed packet is transmitted can be minimized.

Please replace the paragraph beginning at page 42, line 6, with the following rewritten paragraph:

According to a fortieth aspect of the present invention, in the packet data structure of the thirty-ninth aspect, the header section of the compressed packet includes a data existence flag which indicates whether or not any of the plural item-basis compressed data is included in the data section of the compressed packet. Therefore, it is easily decided in short time whether the compressed packet is to be restored ~~or not~~.

Please replace the paragraph beginning at page 46, line 18, with the following rewritten paragraph:

Figures 27(a), ~~and~~ 27(b) and 27(c) are diagrams for explaining transmission data to be transmitted (27(a)) and specific data stored in an uncompressed packet Pi and a compressed packet Pj (27(b)), according to the modification of the fifth embodiment.

Please replace the paragraphs beginning at page 49, line 11, with the following rewritten paragraphs:

Figures 1 to 11 are diagrams for explaining a data transmission method according to a first embodiment of the present invention. This first embodiment corresponds to ~~Claims~~ aspects 1 ~9, 18~21, 32, 33, 36, and 37.

In the data transmission method of this first embodiment, data transmission from a transmitter to a receiver is performed packet by packet. The transmitter forms uncompressed packets and compressed packets and transmits these packets, and the receiver receives these packets from the transmitter and sequentially restores the received packets. In this method, difference data, which is based on transmission data stored in an uncompressed packet that has been transmitted most-recently, is stored in a compressed packet to be transmitted. To be specific, the ~~different~~ difference data stored in the compressed packet to be transmitted is obtained by using the transmission data stored in the

uncompressed packet as reference data, and subtracting the transmission data to be transmitted by the compressed packet from the reference data.

Please replace the paragraphs beginning at page 50, line 16, through page 51, line 2 with the following rewritten paragraphs:

As shown in figure 1(a), an uncompressed packet Pa is composed of a header section Hpa containing header information, and a data section Dpa containing uncompressed data Ir to be transmitted by PPP. The information in the header section Hpa is composed of a compression/uncompression identifier Ih1 indicating whether the data stored in the data section Dpa is compressed ~~or not~~, a packet identifier (ID) Ih2a for identifying this packet, and other header information Ih3. The identifier Ih1 of this uncompressed packet Pa indicates "uncompressed". The uncompressed data Ir is transmission data (D) to be transmitted by the uncompressed packet.

On the other hand, as shown in figure 1(b), the compressed packet Pb is composed of a header section Hpb containing header information, and a data section Dpb containing compressed data Id to be transmitted by PPP. The information in the header section Hpb is composed of a compression/uncompression identifier Ihl indicating whether the data stored in the data section Dpb is compressed ~~or not~~, a reference packet identifier (ID) Ih2b for identifying an uncompressed packet (reference packet) which contains transmission data to be used as reference data, and other header information Ih3. The identifier Ihl of the compressed packet Pb indicates "compressed". The compressed data Id is difference data (ΔD) between the transmission data (reference data) of a most-recent uncompressed packet (reference packet) which has been transmitted previously to the compressed packet Pb, and the transmission data of the compressed packet Pb.

Please replace the paragraph beginning at page 64, line 14 with the following rewritten paragraph:

Subsequently, the packet formation unit 12 forms a compressed packet Pb(2) in which the ~~different~~ <u>difference</u> data (D1-D2) is stored as compressed data Id of the transmission data (D2). In this compressed packet Pb(2), "compressed" is set as the compression/uncompression identifier Ihl, and the identifier (ID=O) which indicates the uncompressed packet Pa(1) as a reference packet

required for restoration of this compressed packet Pb(2) is set as the reference packet identifier Ih2b. Further, when the compressed packet Pb(2) has been formed in the formation unit 12, the reference information management unit 15 does not update the reference packet identifier (ID) and the reference data (D) as the transmitting-end reference information Im1.

Please replace the paragraph beginning at page 68, line 12 with the following rewritten paragraph:

Next, in the restoration unit 23, when the compressed packet Pb(2) is input as a normal packet Pno, it is detected whether the normal packet Pno is a compressed packet or an uncompressed packet with reference to the compression/uncompression identifier Ihl included in the header section of the normal packet Pno. In this case, since the normal packet Pno is the compressed packet Pb(2), the restoration unit 23 inquires of the reference information management unit 25 as to whether the identifier (ID=O) which is included in this compressed packet as the reference packet identifier Ih2b, and the corresponding reference data (D1) are stored in the management unit 25 ~~or not~~.

Please replace the paragraph beginning at page 70, line 23 with the following rewritten paragraph:

Next, it is decided whether the uncompressed packet (reference packet) required for restoration of the difference data in the compressed packet has been received ~~or not~~ (step Sb4). This decision is made by collating the identifier (ID) stored as the reference packet identifier Ih2b in the compressed packet Pb and the corresponding transmission data (D), with the identifier (ID) stored in the reference information management unit 25 and the corresponding reference data (D).

Please replace the paragraph beginning at page 83, line 5 with the following rewritten paragraph:

The uncompressed packet Pc is composed of a header section Hpc containing header information, and a data section Dpc containing uncompressed data Ir to be transmitted by PPP. The information in the header section Hpc is composed of a compression/uncompression identifier Ihl indicating whether the data in the data section is compressed ~~or not~~, a packet identifier (ID) Ih2a for identifying this uncompressed packet, and other header information Ih3. In the data section Dpc,

compression target data which is not compressed (hereinafter referred to as uncompressed target data), and non-target data Inc are stored. The uncompressed target data is composed of three pieces of item-basis uncompressed data Ira, Irb, Irc corresponding to first, second, and third items to be compressed (hereinafter referred to as target items). More specifically, the three pieces of item-basis uncompressed data Ira, Irb, and Irc are transmission data (Da), (Db), and (Dc) corresponding to the first, second, and third target items in the uncompressed packet.

Please replace the paragraph beginning at page 84, line 1 with the following rewritten paragraph:

The compressed packet Pd is composed of a header section Hpd containing header information, and a data section Dpd containing partially compressed data to be transmitted by PPP. The information in the header section Hpd is composed of a compression/uncompression identifier Ihl indicating whether the data in the data section is compressed ~~or not~~, a reference packet identifier (ID) Ih2b for identifying a reference packet, and other header information Ih3.

Please replace the paragraph beginning at page 90, line 12 with the following rewritten paragraph:

Figure 12 is a block diagram for explaining a data transmission method according to a second embodiment of the present invention, illustrating a data transmission apparatus 102 in a data transmission system using this data transmission method. This second embodiment corresponds to ~~Claims~~ aspects 1, 2, 10~12, 18~21, 32, 33, 36, and 37.

Please replace the paragraph beginning at page 95, line 16 with the following rewritten paragraph:

Figures 14 and 15 are diagrams for explaining a data transmission method according to a third embodiment of the present invention. This third embodiment corresponds to ~~Claims~~ aspects 1, 2, 13~15, 18~21, 32, 33, 36, and 37.

Please replace the paragraphs beginning at page 98, line 23 through page 99, line 3 with the following rewritten paragraphs:

Further, while in this third embodiment an ECC is added to every uncompressed packet, it may be decided whether an ECC is to be added to the uncompressed packet ~~or not~~, according to the frequency of restoration error notification which is performed from the receiving end to the transmitting end.

In this case, in the compression/uncompression decision unit 13, the number of times per unit time that the error notification reception signal Sn from the error notification reception unit 14 is input, is counted, and the count is compared with a predetermined reference value Y. According to the result of the comparison, an error correction control signal is output to the formation unit 12. According to the error correction control signal, the formation unit 12 notifies the ECC addition unit 32 as to whether an ECC is to be added to the uncompressed packet ~~or not~~. To be specific, when the count exceeds the reference value Y, the ECC addition unit 32 adds an ECC to the uncompressed packet and outputs it. When the count is equal to or lower than the reference value Y, the ECC addition unit 32 adds no ECC to the uncompressed packet, and outputs the packet as it is.

Please replace the paragraph beginning at page 99, line 25 with the following rewritten paragraph:

Figures 16 and 17 are block diagrams for explaining a data transmission method according to a fourth embodiment of the present invention. Figure 16 illustrates a data transmission apparatus 104 in a data transmission system which employs the data transmission method. This fourth embodiment corresponds to ~~Claims~~ aspects 1, 2, 16~21, 32, 33, 36 and 37.

Please replace the paragraph beginning at page 110, line 14 with the following rewritten paragraph:

Figures 18 to 27 are diagrams for explaining a data transmission method according to a fifth embodiment of the invention, and a data transmission system using the data as transmission method. This fifth embodiment corresponds to ~~Claims~~ aspects 22~31, 34, 35, 38~40.

Please replace the paragraphs beginning at page 111, line 8 with the following rewritten paragraphs:

With reference to figure 18(a), the uncompressed packet Pg is composed of a header section Hpg containing header information, and a data section Dpg containing uncompressed data Ir to be transmitted by PPP (Point to Point Protocol). The information stored in the header section Hpg is composed of a compression/uncompression identifier Ihl indicating whether the data Ir stored in the data section Dpg is compressed ~~or not~~, a packet identifier (ID) for identifying this uncompressed packet, and other header information Ih3. The uncompressed data Ir is transmission data (D) to be transmitted by the uncompressed packet.

With reference to figure 18(b), the compressed packet Ph is composed of a header section Hph containing header information, and a data section Dph containing compressed data Id to be transmitted by PPP. The information stored in the header section Hph is composed of a compression/uncompression identifier Ihl indicating whether the data Id in the data section Dph is compressed ~~or not~~, a reference packet identifier (ID) Ih2b indicating a reference packet which is needed for restoration of the compressed data Id, a reference data updation flag Ih5 indicating whether reference data used for the restoration is to be updated ~~or not~~, and other header information Ih3.

Please replace the paragraph beginning at page 113, line 21 with the following rewritten paragraph:

Further, the data transmission apparatus 105 includes a reference information updation decision unit 17. This decision unit 17 stores the transmission history of compressed packets which have been transmitted to the receiving end, and decides as to whether the reference data is to be updated ~~or not~~ when forming a compressed packet, on the basis of the compression/uncompression identifier Ihl and the reference data updation flag Ih5 which are supplied from the packet formation unit 12e. Every time the packet formation unit 12e forms n packets (e.g, three packets), the decision unit 17 outputs, as the above-described control signal, a reference data updation signal-Jr instructing updation of the reference data, to the packet formation unit 12e. When the updation signal Jr is input to the packet formation unit 12e, "On" indicating that the reference data is to be updated is stored

as the reference data updation flag Ih5 in the header section Hph of the compressed packet Ph, whereby a specific compressed packet is formed. On the other hand, when no updation signal Jr is input to the packet formation unit 12e, "Off" indicating that the reference data is not to be updated is stored as the updation flag Ih5 in the header section Hph of the compressed packet Ph, whereby an ordinary compressed packet is formed.

Please replace the paragraph beginning at page 116, line 13 with the following rewritten paragraph:

Further, in the packet restoration unit 23e, when performing restoration on the compressed packet Ph, it is decided whether the reference packet identifier (ID) and the corresponding reference data (D) which are stored in the compressed packet Ph are stored in the reference information management unit 25e ~~or not~~. According to the result of this decision, an error signal Se which indicates that a restoration error occurs in the compressed packet, is output.

Please replace the paragraph beginning at page 126, line 17 with the following rewritten paragraph:

Thereafter, the packet formation unit 12e inquires of the decision unit 17 as to whether the transmitting-end reference information Imi is to be updated ~~or not~~ (step Sc6), and it is decided whether the information Iml is to be updated ~~or not~~ on the basis of the reference data updation signal Jr from the decision unit 17 (step Sc7).

Please replace the paragraph beginning at page 128, line 20 with the following rewritten paragraph:

On the other hand, when the packet supplied to the restoration unit 23e is the specific compressed packet Ph(5), the restoration unit 23e inquires of the reference information management unit 25e as to whether the reference packet identifier (ID=O) and the corresponding reference data (Dl) which are included in this compressed packet are stored in the management unit 25e ~~or not~~. When the identifier (ID=O) and the data (D1) are stored in the management unit 25e, the restoration

unit 23e restores the transmission data (D5) of this packet by using the reference data (Dl) and the difference data (D1-D5).

Please replace the paragraph beginning at page 130, line 24 with the following rewritten paragraph:

When the normally-received packet is a compressed packet, the packet restoration unit 23e inquires of the reference information management unit 25e as to whether the reference packet identifier (ID) Ih2b and the corresponding reference data (D) which are included in the compressed packet are stored in the management unit 25e ~~or not~~ (step Sd3), and it is decided whether the identifier (ID) and the data (D) are stored in the management unit 25e ~~or not~~ (step Sd4).

Please replace the paragraph beginning at page 131, line 18 with the following rewritten paragraph:

Next, it is detected whether ~~or not~~ the reference data updation flag Ih5 stored in the compressed packet indicates that the reference information is to be updated (step Sd6). When the flag Ih5 indicates that the reference information is to be updated, the identifier (ID) and the reference data (D) which are stored as the receiving-end reference information Im2 in the management unit 25e are updated (step Sd8). Thereafter, the transmission data is output to the output unit 26 (step Sd9). When the flag Ih5 does not indicate that the reference information is to be updated, the transmission data is output to the output unit 25 without updating the receiving-end reference information Im2 (step Sd9).